Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A method of improving the thermal fatigue life of a thermal barrier coating by modifying the grain structure of a diffusion aluminide bond coat that adheres the thermal barrier coating to a surface of a superalloy component, the method comprising the steps of:

depositing the aluminide bond coat on the component so as to be characterized by substantially columnar grains that extend substantially through that portion of the aluminide bond coat overlying the surface of the component, the grains having grain boundaries exposed at the surface of the aluminide bond coat, the surface of the aluminide bond coat having surface irregularities as a result of grain boundary ridges defined by the grain boundaries at the surface of the aluminide bond coat; and then

recrystallizing at least a surface region of the aluminide bond coat during or prior to depositing the thermal barrier coating on the surface of the aluminide bond coat, wherein new grains form at the surface of the aluminide

bond coat and a ceramic layer is deposited on the surface of the aluminide bond coat to form the thermal barrier ~~coating.~~ coating;

wherein following the recrystallizing step the new grains cause the surface of the aluminide bond coat to be smoother and flatter as a result of eliminating at least some of the grain boundary ridges, whereby the ceramic layer is deposited on the smoother and flatter surface of the aluminide bond coat.

Claim 2 (original): A method according to claim 1, wherein recrystallization is induced by peening the aluminide bond coat at an intensity of at least 6A prior to heating the aluminide bond coat.

Claim 3 (previously presented): A method according to claim 1, wherein the aluminide bond coat is heated to a temperature of about 1090°C to about 1120°C during the recrystallizing step.

Claim 4 (original): A method according to claim 1, wherein the new grains have a grain size of not smaller than five micrometers after recrystallization.

Claim 5 (original): A method according to claim 1, wherein the new grains are substantially equiaxed.

Claim 6 (previously presented): A method according to claim 5, wherein the aluminide bond coat is a single-phase or two-phase aluminide prior to recrystallization.

Claim 7 (previously presented): A method according to claim 1, wherein precipitates are present in the grain boundaries of the grains after the depositing step and before recrystallization, and the precipitates are substantially absent from grain boundaries of the new grains after recrystallization.

Claim 8 (previously presented): A method according to claim 7, wherein the aluminide bond coat is a single-phase aluminide after recrystallization.

Claim 9 (currently amended): A method according to claim 1, wherein recrystallization of at least the surface region of the aluminide bond coat occurs during deposition of the thermal barrier coating on the surface of

the aluminide bond coat. ~~wherein:~~

~~following the depositing step the surface of the aluminide bond coat has surface irregularities as a result of grain boundary ridges defined by the grain boundaries at the surface of the aluminide bond coat;~~

~~following the recrystallizing step the new grains cause the surface of the aluminide bond coat to be smoother and flatter as a result of eliminating at least some of the grain boundary ridges, whereby the ceramic layer is deposited on the smoother and flatter surface of the aluminide bond coat.~~

Claim 10 (previously presented): A method according to claim 1, wherein the aluminide bond coat is a platinum aluminide bond coat.

Claim 11 (previously presented): A method of improving the thermal fatigue life of a thermal barrier coating by modifying the grain structure of a diffusion aluminide bond coat that adheres the thermal barrier coating to a surface of a superalloy component, the method comprising the steps of:

depositing the aluminide bond coat on the component by vapor phase aluminizing or by chemical vapor deposition, the aluminide bond coat comprising an additive layer on the surface of the component and a diffusion zone in a surface region of the component, the additive layer being

characterized by columnar grains that extend from the diffusion zone to the surface of the aluminide bond coat, the grains having grain boundaries exposed at the surface of the aluminide bond coat, the surface of the aluminide bond coat having surface irregularities as a result of grain boundary ridges defined by the grain boundaries at the surface of the aluminide bond coat;

peening the surface of the aluminide bond coat at an intensity of at least 6A; and then

heat treating the aluminide bond coat before or while depositing the thermal barrier coating on the surface of the aluminide bond coat so as to recrystallize at least a surface region of the aluminide bond coat, wherein new grains form within the additive layer at the surface of the aluminide bond coat, the new grains causing the surface of the aluminide bond coat to be smoother and flatter as a result of eliminating at least some of the grain boundary ridges and a ceramic layer is deposited on the smoother and flatter surface of the aluminide bond coat to form the thermal barrier coating.

Claim 12 (original): A method according to claim 11, wherein the aluminide bond coat is heat treated at a temperature of about 1090°C to about 1120°C.

Claim 13 (original): A method according to claim 11, wherein the new grains have a grain size of not smaller than five micrometers after the thermal barrier coating has been deposited.

Claim 14 (original): A method according to claim 11, wherein the new grains are substantially equiaxed.

Claim 15 (previously presented): A method according to claim 14, wherein the aluminide bond coat is a single-phase or two-phase aluminide prior to recrystallization.

Claim 16 (previously presented): A method according to claim 11, wherein precipitates are substantially absent from grain boundaries of the new grains after recrystallization.

Claim 17 (previously presented): A method according to claim 16, wherein the aluminide bond coat is a single-phase aluminide after recrystallization.

Claim 18 (previously presented): A method according to claim 11,

wherein the aluminide bond coat is a platinum aluminide bond coat.

Claim 19 (previously presented): A method according to claim 11, wherein tantalum-rich precipitates are present in the grain boundaries of the grains after the depositing step and before recrystallization, and the tantalum-rich precipitates are substantially absent from grain boundaries of the new grains after recrystallization.

Claim 20 (previously presented): A method of improving the thermal fatigue life of a thermal barrier coating by modifying the grain structure of a diffusion aluminide bond coat that adheres the thermal barrier coating to a surface of a superalloy component, the method comprising the steps of:

depositing the diffusion aluminide bond coat on the component by vapor phase aluminizing or by chemical vapor deposition, the diffusion aluminide bond coat comprising an additive layer on the surface of the component and a diffusion zone in a surface region of the component, the additive layer being characterized by columnar grains that extend from the diffusion zone to the surface of the diffusion aluminide bond coat, the grains having grain boundaries exposed at the surface of the diffusion aluminide bond coat, the surface of the diffusion aluminide bond coat having surface

irregularities as a result of grain boundary ridges defined by the grain boundaries at the surface of the diffusion aluminide bond coat;

peening the diffusion aluminide bond coat at an intensity of 6A to 12A;

heat treating the diffusion aluminide bond coat at a temperature and for a duration sufficient to cause recrystallization of the entire additive layer of the diffusion aluminide bond coat, wherein equiaxial grains form within the additive layer, the equiaxed grains causing the surface of the diffusion aluminide bond coat to be smoother and flatter as a result of eliminating at least some of the grain boundary ridges; and then

depositing a ceramic layer on the surface of the diffusion aluminide bond coat to form the thermal barrier coating on the diffusion aluminide bond coat;

wherein the equiaxed grains have a grain size of about fifteen to thirty micrometers.

Claims 21-39 (canceled)